<u>CLAIMS</u>

What is claimed is:

1   1.   Apparatus for correlating a sequence of received samples with chip values of a locally

2 generated sequence for one of a plurality of spreading rates, the apparatus comprising:

3   a first set of combiners configured as a first level of a tree structure to receive the sequence of

4 received samples in groups, each combining a group of at least two samples based on corresponding chip

5 values of the locally generated sequence to generate a correlation value for the group at the first level; and

6   a second set of combiners configured as one or more additional levels of the tree structure,

7 wherein, each combiner of the second set combines a group of at least two correlation values of a previous

8 level of the tree structure to generate a correlation value for the group at a current level of the tree

9 structure, and

10   wherein each combiner of the first and second sets comprises an output tap that enables the

11 corresponding correlation value to be read out of the tree structure for one of the plurality of spreading

12 rates.

1   2.   The invention as recited in claim 1, wherein each of the first set of combiners is an

2 add/subtract logic unit.

1   3.   The invention as recited in claim 2, wherein each add/subtract logic unit the chip values

2 dictate whether the corresponding samples are inverted prior to combining.

1   4.   The invention as recited in claim 1, wherein each of the second set of combiners is an

2 adder.

1   5.   The invention as recited in claim 1, wherein the plurality of spreading rates includes a

2 maximum spreading rate N that is of length of X^M, where X is a positive integer, and each other of the

3 plurality of spreading rates is less than the maximum spreading rate N and is of length X^m, $1 \leq m < M$.

1   6.   The invention as recited in claim 5, wherein each of the first set of combiners is an

2 add/subtract logic unit that combines X input samples based on X chip values of the locally generated

3 sequence, and each of the second set of combiners is an adder, each adder receiving X correlation values

4 for a group from the previous level.

1   7.   The invention as recited in claim 5, wherein X is 2.

1   8.   The invention as recited in claim 1, wherein the apparatus is embodied in a circuit.

1   9.   The invention as recited in claim 8, wherein the circuit is embodied in an integrated

2 circuit.

1   10.   The invention as recited in claim 8, wherein the circuit is included in a receiver of a code-

2 division, multiple access communication system.

1   11.   A method of correlating a sequence of received samples with chip values of a locally

2 generated sequence for one of a plurality of spreading rates, the method comprising the steps of:

3   a) combining, at a first level of a tree structure, groups of at least two received samples based on

4 corresponding chip values of the locally generated sequence to generate a correlation value for each group

5 at the first level; and

6   b) combining, at one or more additional levels of the tree structure, a group of at least two

7 correlation values of a previous level of the tree structure to generate a correlation value for the group at a

8 current level of the tree structure, and

9   c) providing a correlation value of a group at a corresponding output tap of the tree structure for

10 one of the plurality of spreading rates.

1   12.   The invention as recited in claim 11, wherein the plurality of spreading rates includes a

2 maximum spreading rate N that is of length of X^M, where X is a positive integer, and each other of the

3 plurality of spreading rates is less than the maximum spreading rate N and is of length X^m, $1 \leq m < M$.

1   13.   The invention as recited in claim 11, wherein the method is embodied in steps of a

2 processor in an integrated circuit.

1   14.   The invention as recited in claim 11, wherein the method is embodied in a processor of a

2 receiver in a code-division, multiple access communication system.

1   15.   A computer-readable medium having stored thereon a plurality of instructions, the plurality

2 of instructions including instructions which, when executed by a processor, cause the processor to

3 implement a method for correlating a sequence of received samples with chip values of a locally generated

4 sequence for one of a plurality of spreading rates, the method comprising the steps of:

5   a) combining, at a first level of a tree structure, groups of at least two received samples based on

6 corresponding chip values of the locally generated sequence to generate a correlation value for each group

7 at the first level; and

8   b) combining, at one or more additional levels of the tree structure, a group of at least two

9 correlation values of a previous level of the tree structure to generate a correlation value for the group at a

10   current level of the tree structure, and

11   c) providing a correlation value of a group at a corresponding output tap of the tree structure for

12   one of the plurality of spreading rates.